

**Abstract**

Disclosed is an electromagnetic ultrasonic probe for coupling-media-free generation and reception of ultrasonic waves in the form of linearly polarized transverse waves in a workpiece (5), respectively from a workpiece (5), having a unit which generates the ultrasonic waves inside the workpiece (5) and which is provided with a transmission coil arrangement (7), to which a high-frequency voltage can be applied to generate a high-frequency magnetic field, and a premagnetizing unit (V) to generate a quasi-static magnetic field superimposing the high-frequency magnetic field in the workpiece (5), and an ultrasonic waves reception unit providing a reception coil arrangement (8) which can be connected to an evaluation unit, with the transmission coil arrangement (7) and the reception coil arrangement (8) being disposed torus-shaped at least on one partially toroidally designed magnetic core (6), which is provided with two front ends (11) which can be turned to face the workpiece (5) and via which the high-frequency magnetic fields can be coupled into, respectively coupled out of, the workpiece (5).

The present invention is distinguished by the premagnetizing unit (V) being contactable directly or indirectly with the workpiece (5) via a contact area (9) and by the at least one partially torodially designed magnetic core(6) being disposed laterally next to the contact area (9) of the premagnetizing unit (V) in such a manner that the premagnetizing unit (V) can project over the partially toroidally designed magnetic core (6) perpendicular to the contact area (9).

(Figs. 1a,b)